Lab Program-6:

Create a package CIE which has two classes- Student and Internals. The class Personal has members like usn, name, sem. The class internals has an array that stores the internal marks scored in five courses of the current semester of the student. Create another package SEE which has the class External which is a derived class of Student. This class has an array that stores the SEE marks scored in five courses of the current semester of the student. Import the two packages in a file that declares the final marks of n students in all five courses.

```
import cie.*;
import see.*;
import java.util.*;
class W8EP1{
  public static void main(String[] args) {
     Scanner input = new Scanner(System.in);
     externals[] e = new externals[2];
     internals[] in = new internals[2];
     for(int i=0;i<2;i++){
        int usn1 = input.nextInt();
        String name1 = input.next();
        int sem1 = input.nextInt();
        int[][] cie = new int[2][5];
        int[][] see = new int[2][5];
        for(int j=0;j<5;j++){
          cie[i][j] = input.nextInt();
        }
        for(int j=0;j<5;j++){
          see[i][j] = input.nextInt();
       }
        e[i] = new externals(usn1,name1,sem1,see[i]);
        in[i] = new internals(usn1,name1,sem1,cie[i]);
        int total = 0;
        System.out.println("Name: "+e[i].name);
        System.out.println("USN: "+e[i].usn);
        System.out.println("sem: "+e[i].sem);
        for(int j=0;j<5;j++){
          total = e[i].seeMarks[j]+in[i].cieMarks[j];
          System.out.print("Final marks: "+total+" ");
       } System.out.println();}}}
```

WriteUp-6:

Lab Programe - 6 Droate a package CFE in hoch how two classes - Student Estabuses. The class Personal has nombers like Usn, norm, som. The dass internals has an array that stores the internal works severed infine Courses of the ch cielissijs = input. noutint () See [i]Cj] = input heat Int(); - her schernals (un), namel, sem, seelis for out println (" sem: " + e[i] total = c(i) - Beemark(5)+ n(i) - cie Markeli) - System out printer (4) Final

System-out printen ("Final marks, " + told System.out-println()3 Package Cici public las some;
public lint yn;
public stroing name;
public int sem;
public student Cintur, String name;
intsem) this, hame > name; this - sem - sem? package Cie; Solic clays intervalus extendes Students public into six Marks = new into); public - Internala Cint un, Strong name 1 intern yint I ge Marks) & Super (un, nam, sem); this - Cie Marks > Ge Marks; package see; import cie. :; public closs enternals extends Steedart h public ant [3 use Marks - new int Co]; public reaturnals Cint us, storing name inter, 1'nt ? see Marks) 1 Syper C usn, name (lem); this see Marks 2 see Marks,

Output-6:

```
C:\Users\skbal\Desktop\00JLabProragmes\Lab Program-6>java W8EP1
146
balaji
48 35 49 48 47
100 98 97 87 91
Name: balaji
USN: 146
sem: 3
Final marks: 148 Final marks: 133 Final marks: 146 Final marks: 135 Final marks: 138
123
dammu
20 29 29 29 39
88 88 88 88
Name: dammu
USN: 123
sem: 3
Final marks: 108 Final marks: 117 Final marks: 117 Final marks: 117 Final marks: 127
C:\Users\skbal\Desktop\00JLabProragmes\Lab Program-6>
```

Lab Program-7:

```
Write a program to demonstrate generics with multiple object parameters.
class Gen<T,S>{
  private T obj;
  private S obj1;
  Gen(T value,S value2){
     obj = value;
     obj1 = value2;
  T getObj(){
     return obj;
  S getObj1(){
     return obj1;
  void objType(){
     System.out.println("The type of object "+obj.getClass().getName());
  void objType1(){
     System.out.println("The type of object "+obj1.getClass().getName());
}
```

```
public class lab7{
    public static void main(String[] args){
        Gen<Integer,Double> ob = new Gen<Integer,Double>(88,88.889);
        ob.objType();
        System.out.println("Object Value "+ob.getObj());
        ob.objType1();
        System.out.println("Object Value "+ob.getObj1());
        Gen<String,Integer> ob2 = new Gen<String,Integer>("abcdefghij",12);
        ob2.objType();
        System.out.println("Object Value "+ob2.getObj());
        ob2.objType1();
        System.out.println("Object Value "+ob2.getObj1());
    }
}
```

WriteUp-7:

Lab Program -) Write a program de demostrale generics with multiple object sparameters. System. out. priviles ["The typosogical Obj: get Class (). get Marnel) System.oul.println(1Thetype of object. 11+0by)-get Class(), get Name()); voich madn

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A TO THE RESIDENCE OF THE PARTY WAS A STREET	Sustemioral control (10/-11/1)	
	System.out. println("Object Value. " got. System.out. println("Object Value. " foliage Cron < String y Theger > Obd = new from < 16%; Obd obj Type (). Sue ferm. Out. println ("Olych Value. " foliage Sue ferm. Out. println ("Olych Value. " foliage Sue ferm. Out. println ("Olych Value. " abcdef", 21);	getner > 1
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	Saston. Out printen (Object Value, 11 + ola).	110/10 2161
	Sgstern. Och, printen ("Object Value." & vho. o.	20p) 1(1
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Output-7:

```
C:\Users\skbal\Desktop\00JLabProragmes>cd lab7
C:\Users\skbal\Desktop\00JLabProragmes\lab7>javac lab7.java
C:\Users\skbal\Desktop\00JLabProragmes\lab7>java lab7
The type of object java.lang.Integer
Object Value 88
The type of object java.lang.Double
Object Value 88.889
The type of object java.lang.String
Object Value abcdefghij
The type of object java.lang.Integer
Object Value 12
C:\Users\skbal\Desktop\00JLabProragmes\lab7>
```

Lab Program-8:

Write a program that demonstrates handling of exceptions in inheritance tree. Create a base class called "Father" and derived class called "Son" which extends the base class. In Father class, implement a constructor which takes the age and throws the exception Wrong Age() when the input age<0. In Son class, implement a constructor that cases both father and son's age and throws an exception if son's age is >=father's age. import java.util.*;

```
class ageException extends Exception{
  int detail:
  ageException(int a){
     detail = a;
  }
  public String toString(){
     return "Exception:"+detail+" the enterred age does not match the category";
  }
class Father{
  int age;
  Father(int age) throws ageException{
     this.age = age;
     if(this.age<=0){
       throw new ageException(this.age);
     }
  }
```

```
void display(){
     System.out.println("Father's age:"+this.age);
  }
}
class Son extends Father{
  Father f;
  Son(int age,Father f) throws ageException{
     super(age);
     this.f = f;
     if(this.age>=this.f.age){
       //System.out.println(f.age);
       throw new ageException(this.age);
     }
  }
  void display(){
     this.f.display();
     System.out.println("Son's age:"+this.age);
  }
}
public class lab8{
  public static void main(String[] args){
     try{
       Scanner input = new Scanner(System.in);
       Father f = new Father(input.nextInt());
       Son s = new Son(input.nextInt(),f);
       s.display();
     }catch(Exception e){
       System.out.println(e);
```

WriteUp-8:

mysort Daving while a program what domail scales handling of Exceptions in inheritance dose , create a base alars Faler " and closited claw collised !! Son" while colonals the base class - Intedles class, implementerent on the color is het theken the age Eithrow. The exaption warp Age (when the input eige = o Sonclass, I sylement on constructor I had care hall tather Sison's rage Cutherens our or explicion if son began refather mpost java. util. K. extends to reguliar & class age Exception int details age Exaption (inta) details = a; public String to String () (
return "1 Exception: "fallwilt "oth endered agreed count Match the category 11? day father Father (intage) Hurous age Exception ? this age = age; (this age < =0) throw how age Exception (this age 3 Void display (System-out-pointly ("Father & age: "+ this age)

class Son extends Father? Son (intage, Father J.) throat age Exception?

Super large);

If (this age > = this . f. age) {

throw new age Exaption (this age); phiblic studic world main (String) Scanner input 2 hw Scanner Elysten-in) Father f'2 new Father Cinymb. neat Fut (1); Son-Sznus Son ((nput-rust Int (),) S. display(); catch (Exception e)(System. Out-println(e);

Output-8:

```
C:\Users\skbal\Desktop\00JLabProragmes\lab8>javac lab8.java
C:\Users\skbal\Desktop\00JLabProragmes\lab8>java lab8
25
12
Father's age:25
Son's age:12
C:\Users\skbal\Desktop\00JLabProragmes\lab8>java lab8
Exception :- 2 the enterred age does not match the category
C:\Users\skbal\Desktop\OOJLabProragmes\lab8>java lab8
23
25
Exception :25 the enterred age does not match the category
C:\Users\skbal\Desktop\OOJLabProragmes\lab8>java lab8
30
-2
Exception :-2 the enterred age does not match the category
C:\Users\skbal\Desktop\00JLabProragmes\lab8>
```

Lab Program-9:

Write a program which creates two threads, one thread displaying "BMS College of Engineering" once every ten seconds and another displaying "CSE" once every two seconds public class ThreadMultiDemo {

```
public static void main(String args[]) {
    B ob2 = new B();
    A ob1 = new A();

try {
    ob2.t.join();ob1.t.join();
} catch (InterruptedException e) {
```

```
System.out.println("Main thread Interrupted");
               }
               System.out.println("Main thread exiting."); }
}
class A implements Runnable {
Thread t;
A() {
t = new Thread(this, "Demo Thread");
t.start();
}
public void run() {
try {
for(int i = 25; i > 0; i--) {
System.out.println("CSE " );
Thread.sleep(2000);
}
} catch (InterruptedException e) {
System.out.println("CSE interrupted.");
}
System.out.println("Exiting CSE thread.");
}
class B implements Runnable {
```

```
Thread t;
B() {
t = new Thread(this, "Demo Thread");
t.start();
}
public void run() {
try {
for(int i = 5; i > 0; i--) {
System.out.println("BMS College of Engineering ");
Thread.sleep(10000);
}
} catch (InterruptedException e) {
System.out.println("BMS interrupted.");
}
System.out.println("Exiting BMS thread.");
}
}
```

WriteUp-9:

Drike ap rogram which crows the othrough on the outhoused of the outhoused of the control one are a second of another displaying and a second of Clery has seconds public clas Throad MultiDemo C public static void mais (Storing args()) B ob 2 = new B(); A ob = nun A(); tog L

Obs. +. join(). Obl. + join();

Scarten. (Interrupted Exception c) (

System out. prindln ("Main others Interrupted"); System-out-println ("Main chread cuiting."); Class A implements Rupnable (Thread f-+ = him Thread (this, "Buno Thread") 7 - Start (); public void runt Jor (inti=28;1>0;1--){ System-oux-printen ("(SE"); Thread sleep (2000); 3 catch (Interrupted & neightion e System Out priviles ("CSE Tenturpuled.")

System.out. println [11 Exchang CSE Hready] Class B Implements Runnable of +2 new Thread Cthis, DemoThread (1) · Start (); poblic void run (inti=5.1>0.1-)}
-ous.pointen. (118ms collage of Engineering) Thread sfeps £ 10000). Coutch (Enterrupted Exception C) X System Out point In (1 BMs 1 herrypted!)); System out. printely ("Exiting BMS thread.")

Output-9:

```
C:\Users\skbal\Desktop\00JLabProragmes\lab9>javac ThreadMultiDemo.java
C:\Users\skbal\Desktop\00JLabProragmes\lab9>java ThreadMultiDemo
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
Exiting BMS thread.
Exiting CSE thread.
Main thread exiting.
C:\Users\skbal\Desktop\00JLabProragmes\lab9>
```

Lab Program-10:

Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the

```
program would throw a NumberFormatException. If Num2 were Zero, the program would throw
an Arithmetic Exception Display the exception in a message dialog box.
import java.awt.*;
import java.awt.event.*;
class MyDiaolg extends Dialog {
 Button bl;
 private String msg1;
 MyDiaolg(Frame parent, String title, boolean mode, String msg1){
 super(parent, title, mode);
 setLayout(new FlowLayout());
 setSize(300,300);
 this.msg1 = msg1;
 bl = new Button("Close");
 add(bl);
 bl.addActionListener((ae)-> dispose());
 addWindowListener(new WindowAdapter() {
        public void windowClosing(WindowEvent we) {
               dispose();
        }
 });
 public void paint(Graphics g) {
        g.drawString(msg1, 30, 80);
}
}
public class lab10 extends Frame implements ActionListener{
 String msg="";
 TextField num1,num2,res;
 Button division;
 public lab10(){
  setLayout(new FlowLayout());
  new Color(0.1,1,1);
  Label number1 = new Label("NUMBER1:");
 num1 = new TextField(10);
 Label number2 = new Label("NUMBER2:");
 num2 = new TextField(10);
  division = new Button("\\");
 Label result = new Label("RESULT:");
 res = new TextField(10);
 add(number1);
 add(num1);
 add(number2);
 add(num2);
```

```
add(division);
 add(result);
 add(res);
 num1.addActionListener(this);
 num2.addActionListener(this);
 division.addActionListener(this);
 res.addActionListener(this);
 addWindowListener(new MywindowAdapter());
 public void actionPerformed(ActionEvent e){
  double c;
 try{
   int no1 = Integer.parseInt(num1.getText());
   int no2 = Integer.parseInt( num2.getText());
   c = no1/no2;
   res.setText(String.valueOf(c));
 } catch(ArithmeticException ex2){
         new MyDiaolg(this,"error",true,""+ex2).setVisible(true);
         }
  catch(NumberFormatException ex1){
   new MyDiaolg(this,"error",true,""+ex1).setVisible(true);
 }
 public static void main(String args[])
 lab10 b=new lab10();
 b.getSize(new Dimension(2000,3000));
 b.setTitle("Lab 10");
 b.setVisible(true);
 }
class MywindowAdapter extends WindowAdapter{
       public void windowClosing(WindowEvent we){
              System.exit(0);
WriteUp-10:
```

-ab-10 - P sag sum Drite a program that create togethround a wer interface to perform integer slivisions. The wer tonber two humbers on the text colds Num a Nums. The divisions NUMI & Warms is displayed on the Routh field when the Divide button to clacked. If Num (is Nums diverse not triby, ish program whould throw's Number to material to Mundier prof the programusail throw Arithmetic & reaption in dialogs import java ant ! import journ and overt + Class My Dialog extends : Dialog (Button bl Private String megl My Dialog CErame parent, It ring title, boolean mode, Stoling rough) (Super (purent, title, mode). Softayout (new Flow/ayout()): Set 512 e (300, 300) this msg1=msg1: bl= New Duffon ("Close"). add(bl); add Action Listoner E(ae) -> dispose ()); add Window Listener (new Window Adapter Dd public void window Closing C Window Event we) { dispose (). public void pain (Groaphics g g. dowskying [Might 30, 80). public class tabil and endends Frame inplements Action Listener

String MSg = 111; Text Field num 1 , num 2, res; Button diwision; public lab 10() { SetCayout (new Flow & ayout)); Cabel number = new Cabel number ("Numper 1") hum = new Test Field (10); Cabel number = new Cabel ("NUMBER2") nume = now Text Field (10). drivision - new Button (11711). Label visult = new Label ((1/KESUCT:)1)res = new Foot Field (10); add (pumber!). add Cdirision) add Circult); add Cres). hum, add Action Listener (this) hums cedelActionListoner(fhis). res add Action Listener Chart add Window i stems (new Myhandow Adapsterl); public roid author Performed (Action Frient e) double C; int not = Integer parsetut (num (: get Text()); int not = Integer parsetut (num & get text()); C= nollnuz res - set Pert (String value of (2)); 3 catch C Arthmeti (Exception exce)

(Date
new MyDialog Cthis Marrorh, true, 1111+ esca Just Visible Ctrue):
> (Sible (+ rue))
new My bialog Cthis, 11 orner 11, true, 11 11 posses set
- Misible (true);
public Static void main CStrongarge (3)? lab 10 to = new lab 10 ()
b- got Size Crew Dimenyion (2000, 3000)-
b. get Size (new Dimension (2000, 3000); b. get Title (" publoh);
b. Set Ursible (true).
Class M. Istrala athal of a partial la 194 de Mal ha
Class My Window Helapter extends Window Adequates Lphblic void purndow Classing CW Endow Event
we) 1
System-exit(0):
30
,

Output-10:

NUMBER1: 13 NUMBER2: 2 1 RESULT: 6.5



